

***Sustain the Mission — Secure the Future***



# **Searching for Sustainability in an Encroaching and Transforming Environment**

**23 August 2004**

Prepared by

**David S. Eady  
Marstel-Day, LLC**

# Report Documentation Page

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# Sustainability Defined

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- the ability of a society, ecosystem, or other ongoing **system** to continue **functioning** into the indefinite future without being forced into decline through the exhaustion or overloading of the key **resources** on which that system depends
  - Robert Gilman (1992); American Institute of Architects (1996)
- the ability of a system to continue activity over a desired time
  - Change Reengineering (1999-2000)
- capacity for continuance into the long term future
  - The SIGMA Project 2003



# Sustainability Aspects

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- Resources
  - Extraction, production, consumption
- Waste
  - Generation, disposition
- Ecosystems
  - Manipulation, displacement, disruption
- Humans / Communities
  - Well-being (physical, mental, social, financial)



# Nature's Unique Contribution

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- It provides resources...
- It performs ecological services...
- It absorbs wastes...

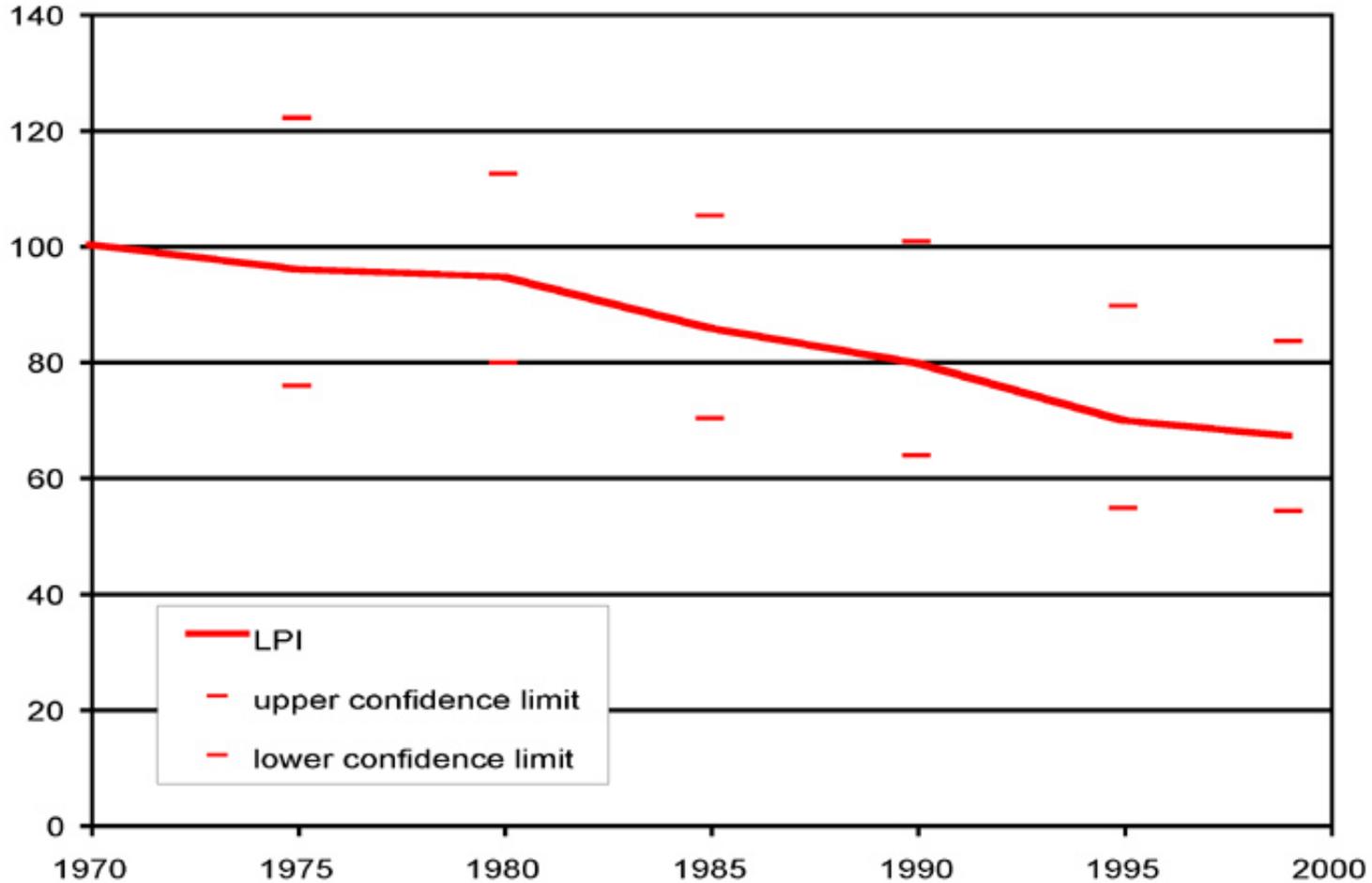
## Nature's "Rules"

- Don't use up all the resources
- Don't disrupt ecological services – life support
- Don't overwhelm waste-absorption capacity



# Living Planet Index

## Years 1970 - 2000



Source: Living Planet Report (2000)

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# Ecosystem Indices



Fig. 1:  
**LIVING PLANET INDEX,  
1970-99**

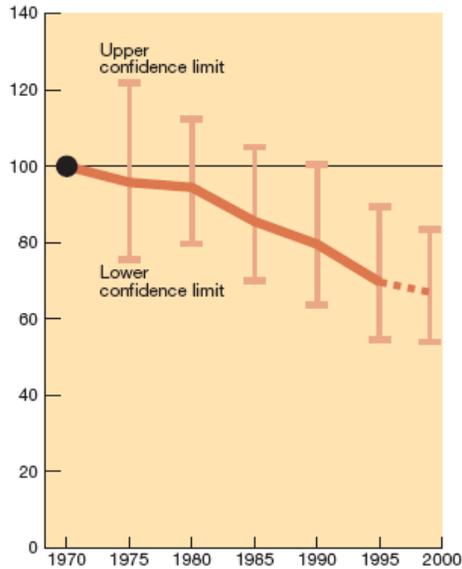


Fig. 3:  
**GLOBAL FOREST ECOSYSTEMS  
INDEX, 1970-99**

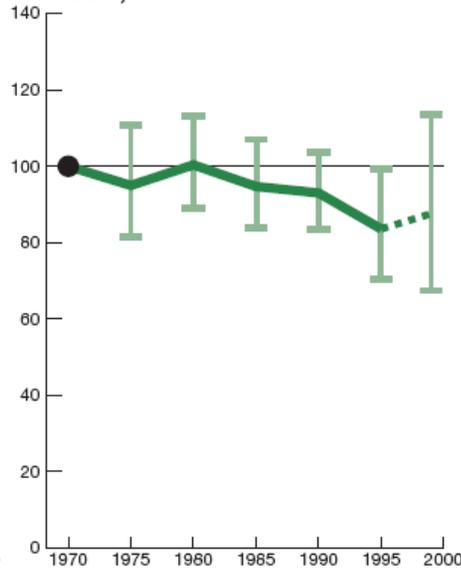


Fig. 4:  
**FRESHWATER SPECIES  
POPULATION INDEX, 1970-99**

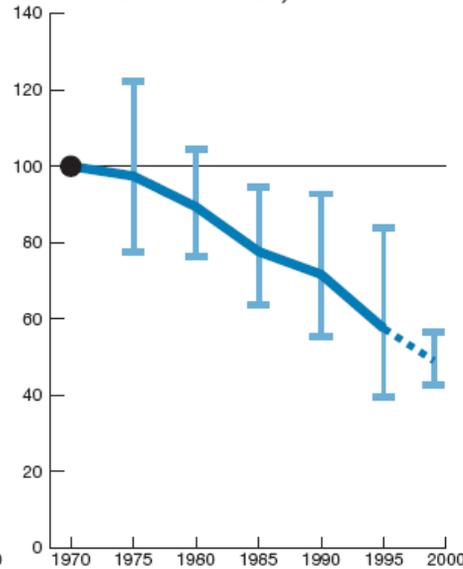
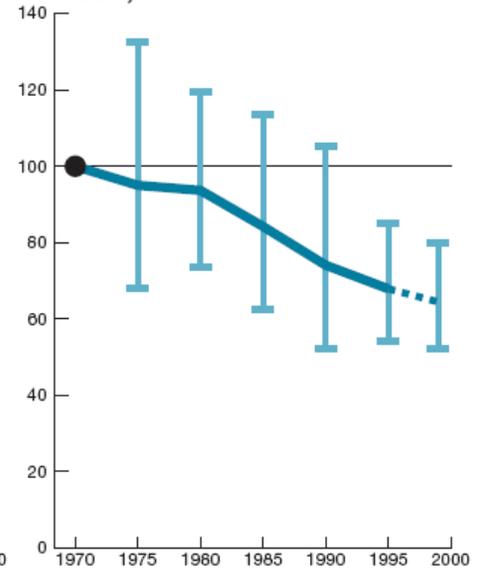


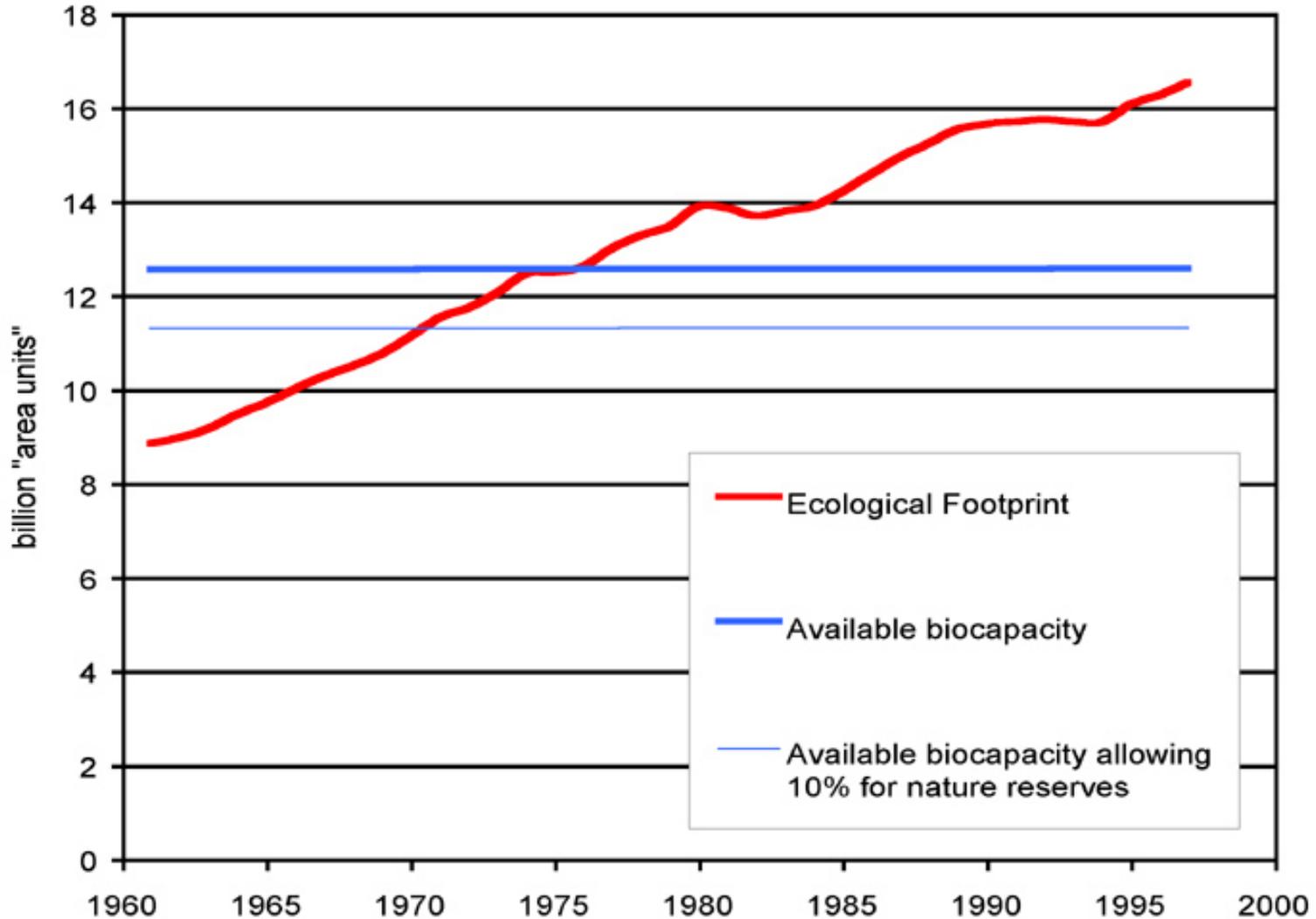
Fig. 5:  
**MARINE SPECIES POPULATION  
INDEX, 1970-99**



Source: Living Planet Report (2000)



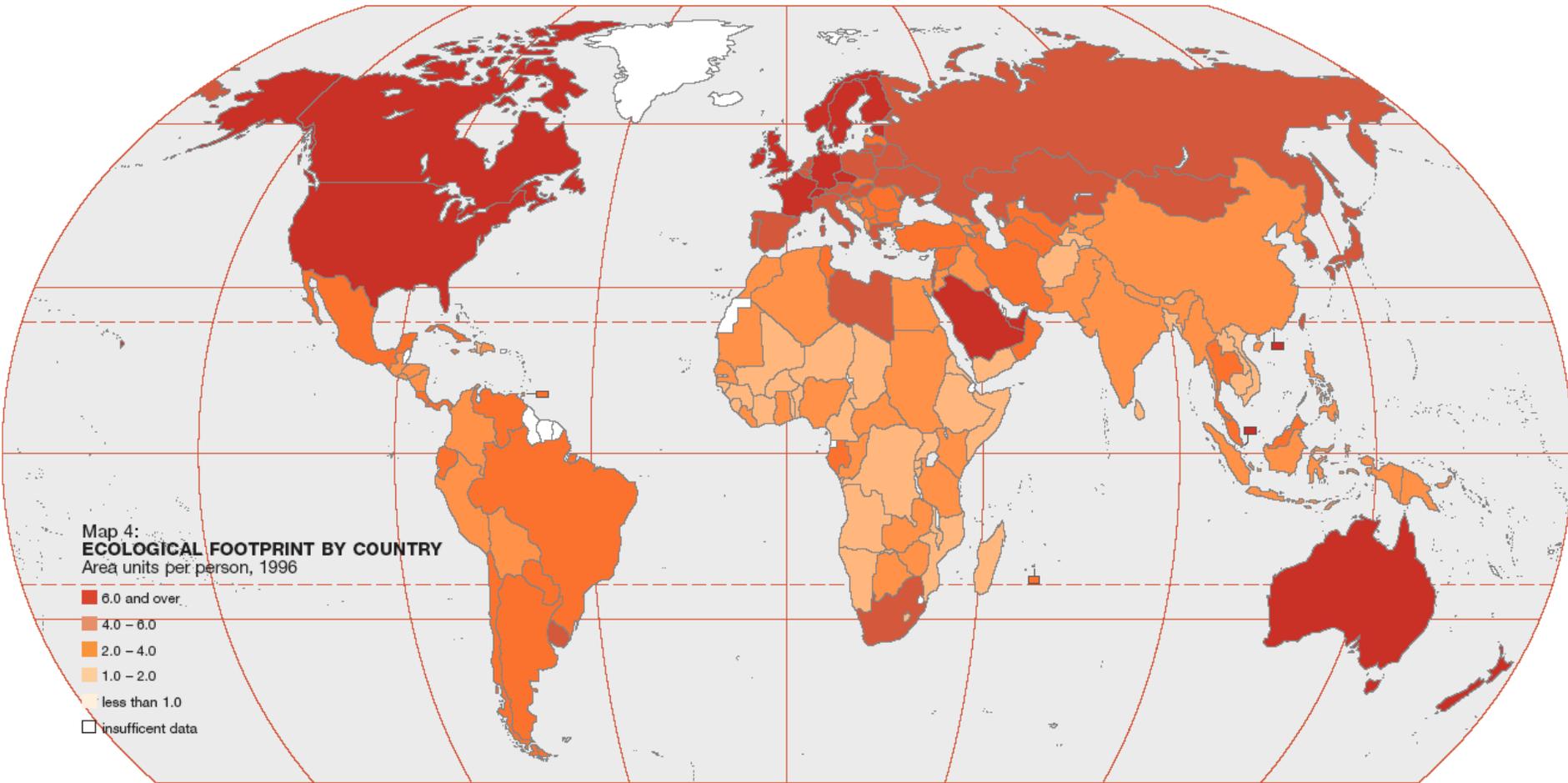
# Ecological Footprint



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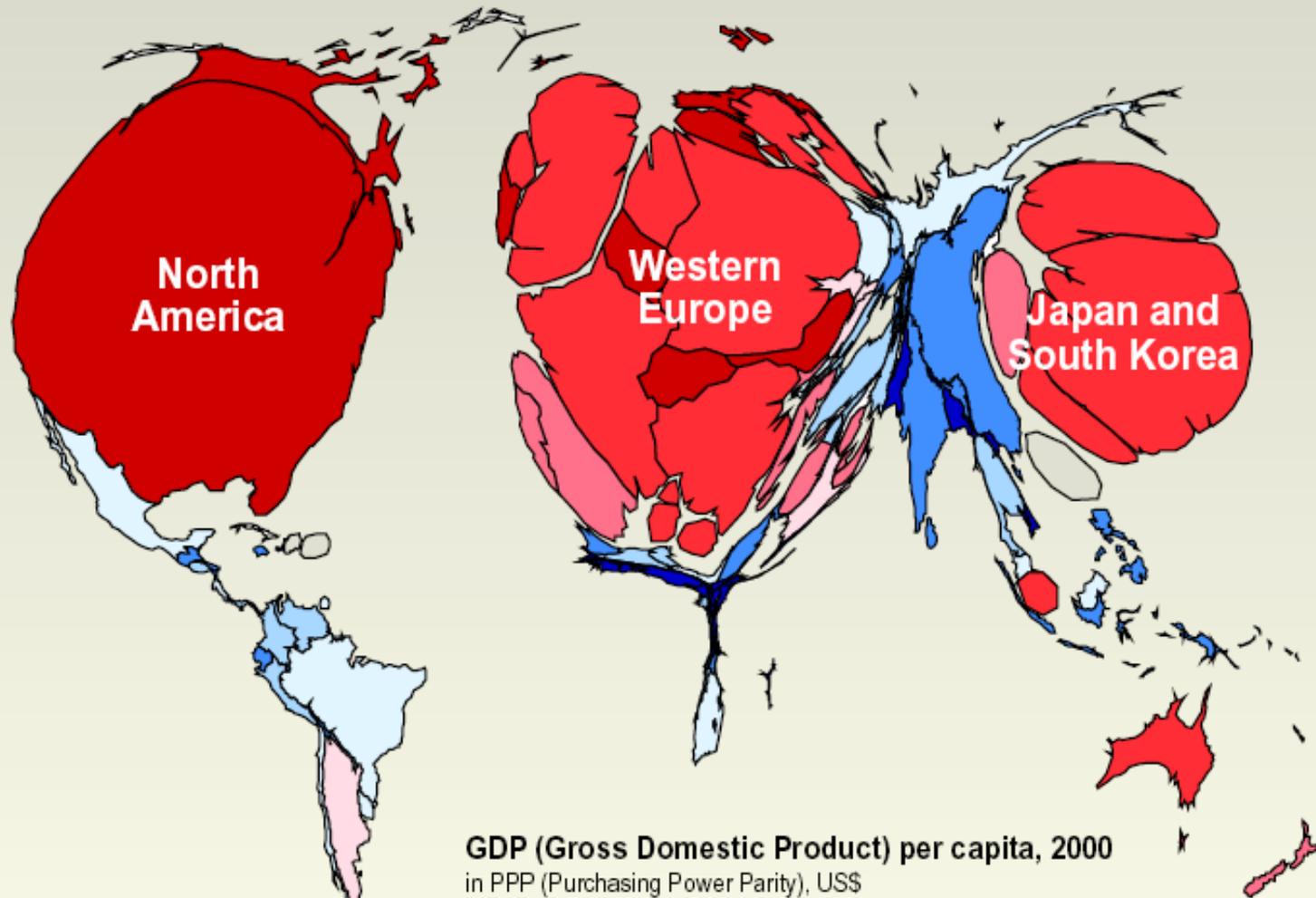


# Ecological Footprints of Nations

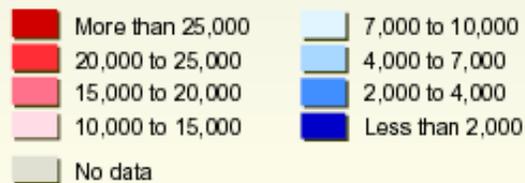


Source: Living Planet Report (2000)

# AN ALTERNATIVE VIEW OF THE WORLD



**GDP (Gross Domestic Product) per capita, 2000**  
in PPP (Purchasing Power Parity), US\$



## Value

 This square represents  
100 billion US dollars



# What “Business” Are **We** In?



We’re in the security business!

- Security:
  - “freedom from doubt, anxiety or fear”
  - “freedom from fear of *privation* or attack”
- Privation:
  - “lack of *basic necessities* or comforts of life”

Sustainability and security are both about protecting long-term national interests

THE WEST



MAPPING AMERICA'S WAR ON TERRORISM: AN AGGRESSIVE NEW STRATEGY

The maps on these pages show all United States military responses to global crises from 1990 to 2002. Notice that a pattern emerges. Any time American troops show up—be it combat, a battle group pulling up off the coast as a reminder, or a peacekeeping mission—it tends to be in a place that is relatively disconnected from the world, where globalization hasn't taken root because of a repressive regime, abject poverty, or the lack of a robust legal system. It's these places that incubate global terrorism. Draw a line around these military engagements and you've got what I call the Non-Integrating Gap. Everything else is the Functioning Core. The goal of this new strategy is simple: Shrink the Gap. Don't contain it, shrink it. —THOMAS P. M. BARNETT

MAP KEY

U.S. MILITARY RESPONSES SINCE 1990

- Combat
- Show of force
- Contingency positioning, reconnaissance
- Evacuation, security
- Peacekeeping

Future hot spot

The views expressed in this article are those of the author and do not necessarily reflect any official policy of the U.S. government.

Functioning Core

Functioning Core

Boundary of the Non-Integrating Gap

Boundary of the Non-Integrating Gap

Functioning Core

MAP KEY

U.S. MILITARY RESPONSES SINCE 1990

- Combat
- Show of force
- Contingency positioning, reconnaissance
- Evacuation, security
- Peacekeeping

Future hot spot

THE EAST



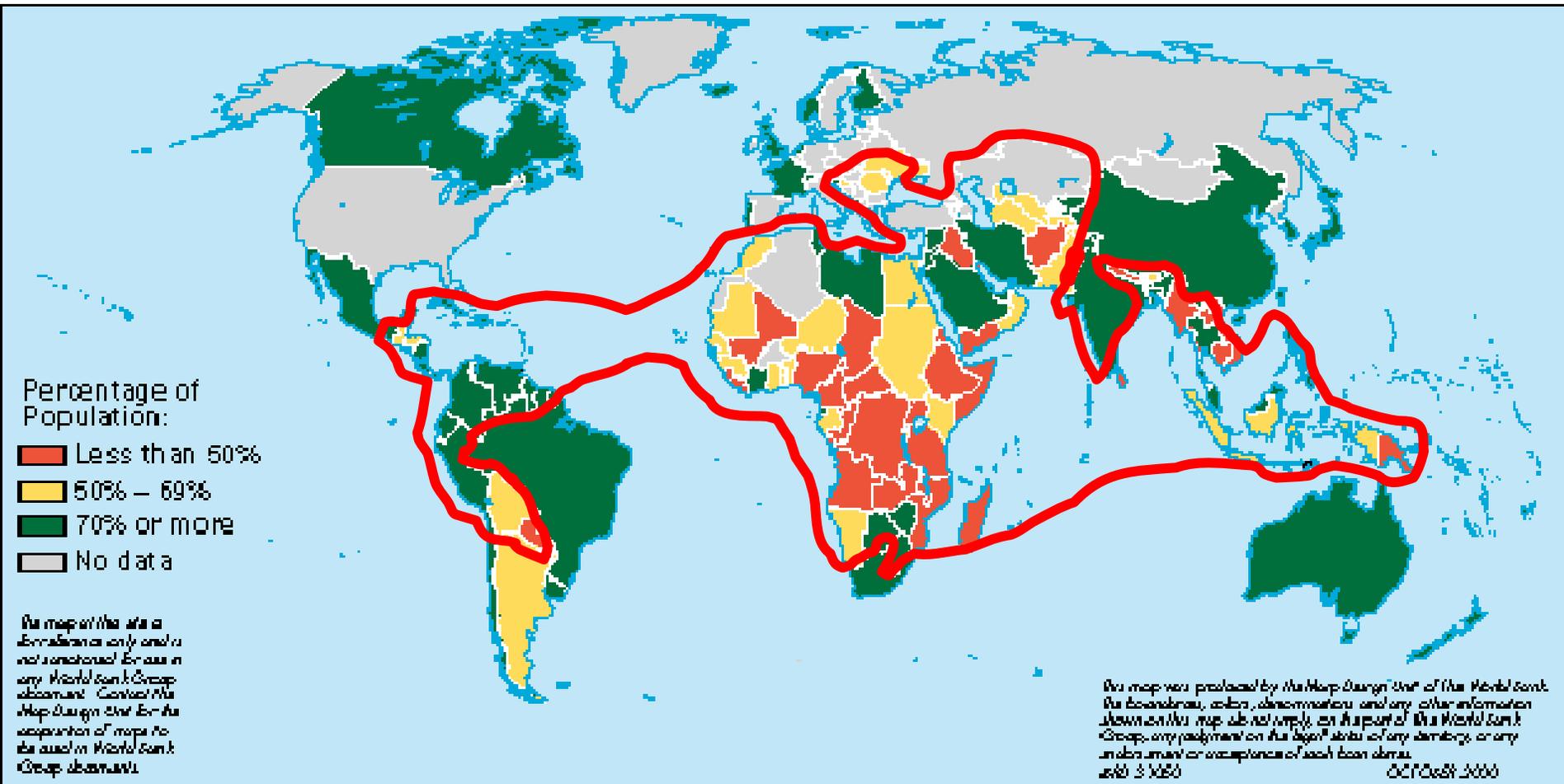
ROBERT V. GILLESPIE, AREA INFORMATION CENTER, MEMPHIS, TN  
SCALE 1:10,000,000  
ONE INDIVIDUAL'S RESPONSES

0 200 400 600 800 1000 1200 Miles

Response data source: Departments of the Army, Air Force, and Navy via C. Henry H. Gaffney & J. The CIA Corporation

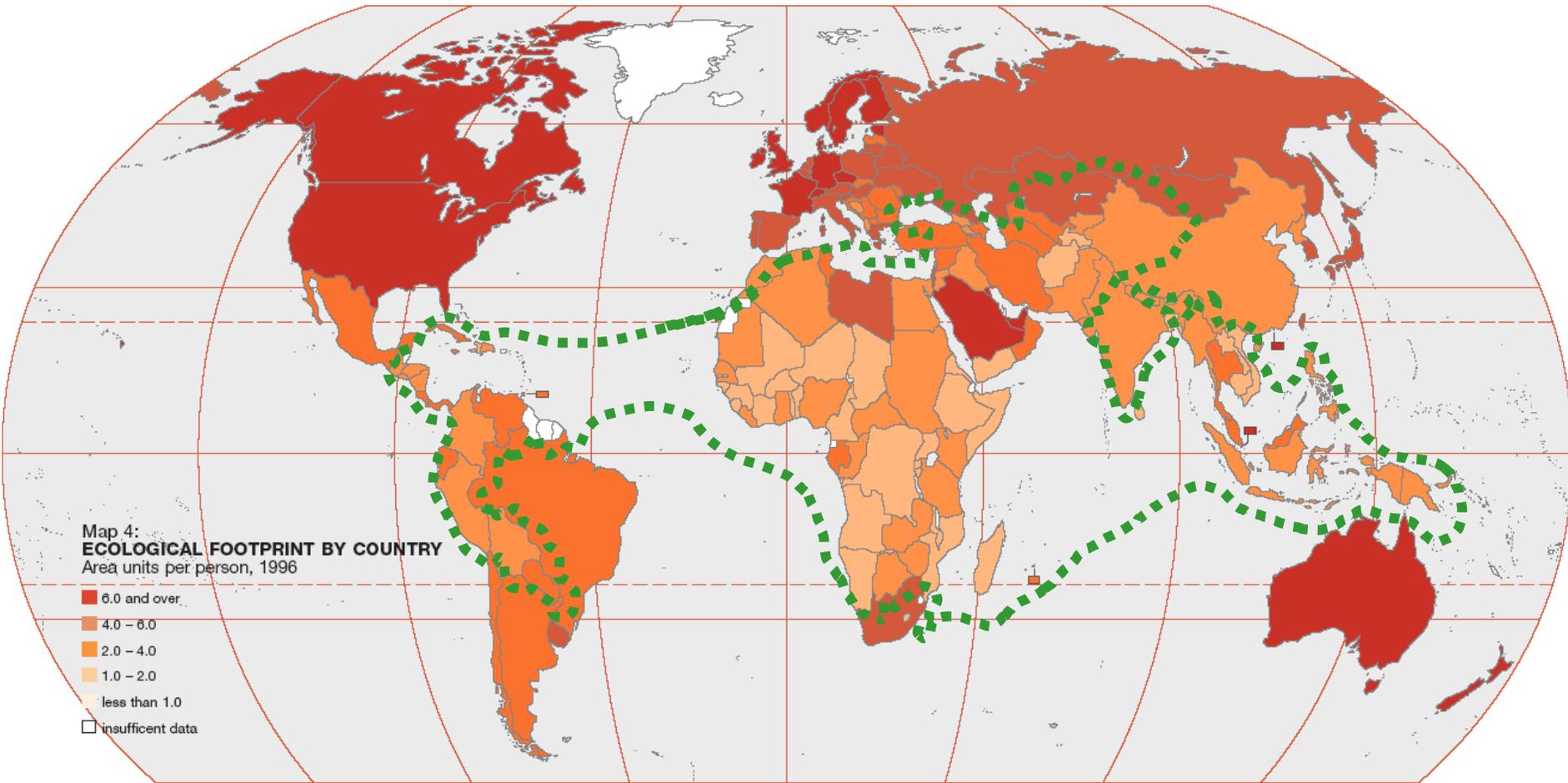


# Access to Safe Water, 1990-96

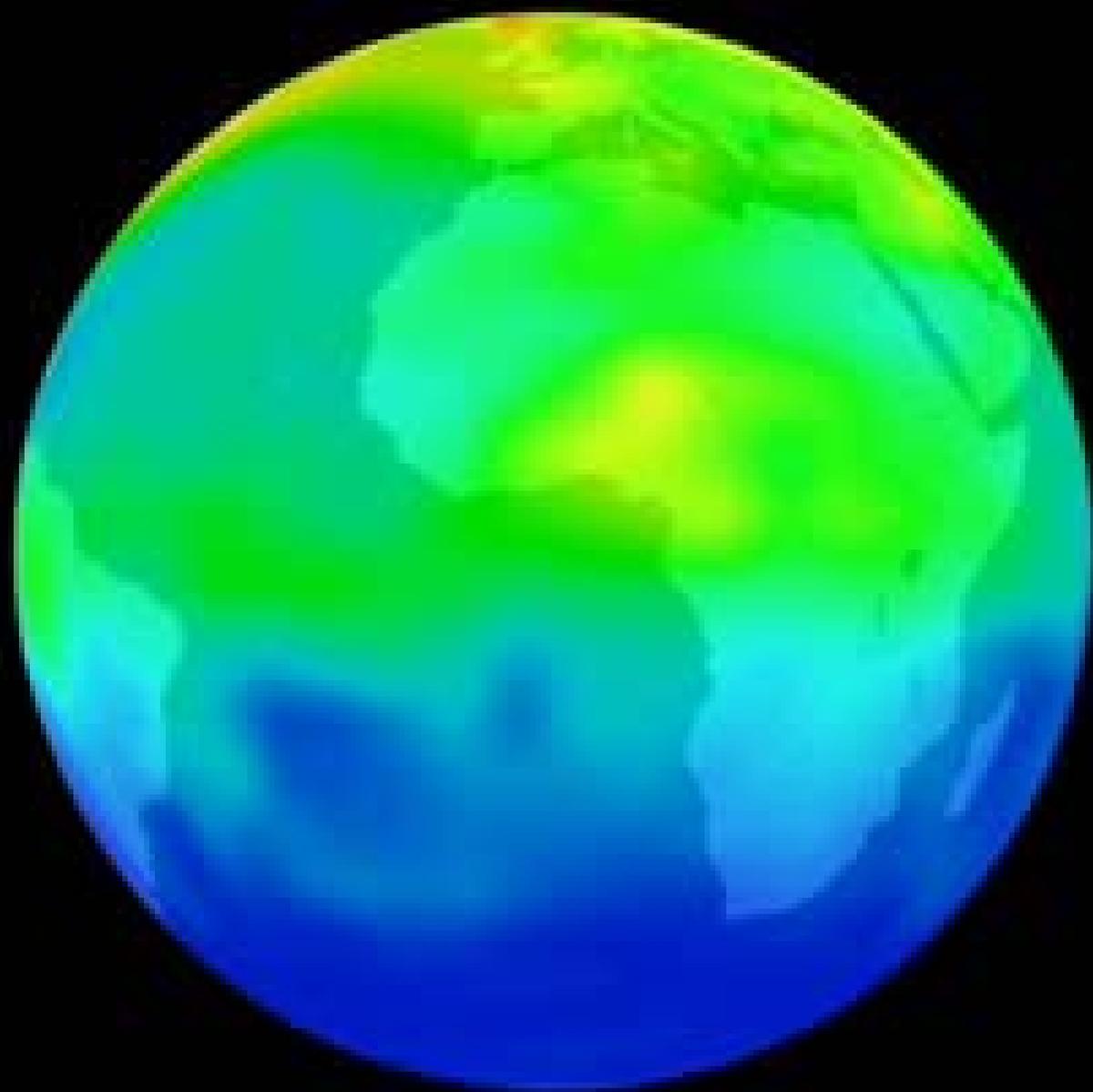




# Ecological Footprints of Nations



Source: Living Planet Report (2000)



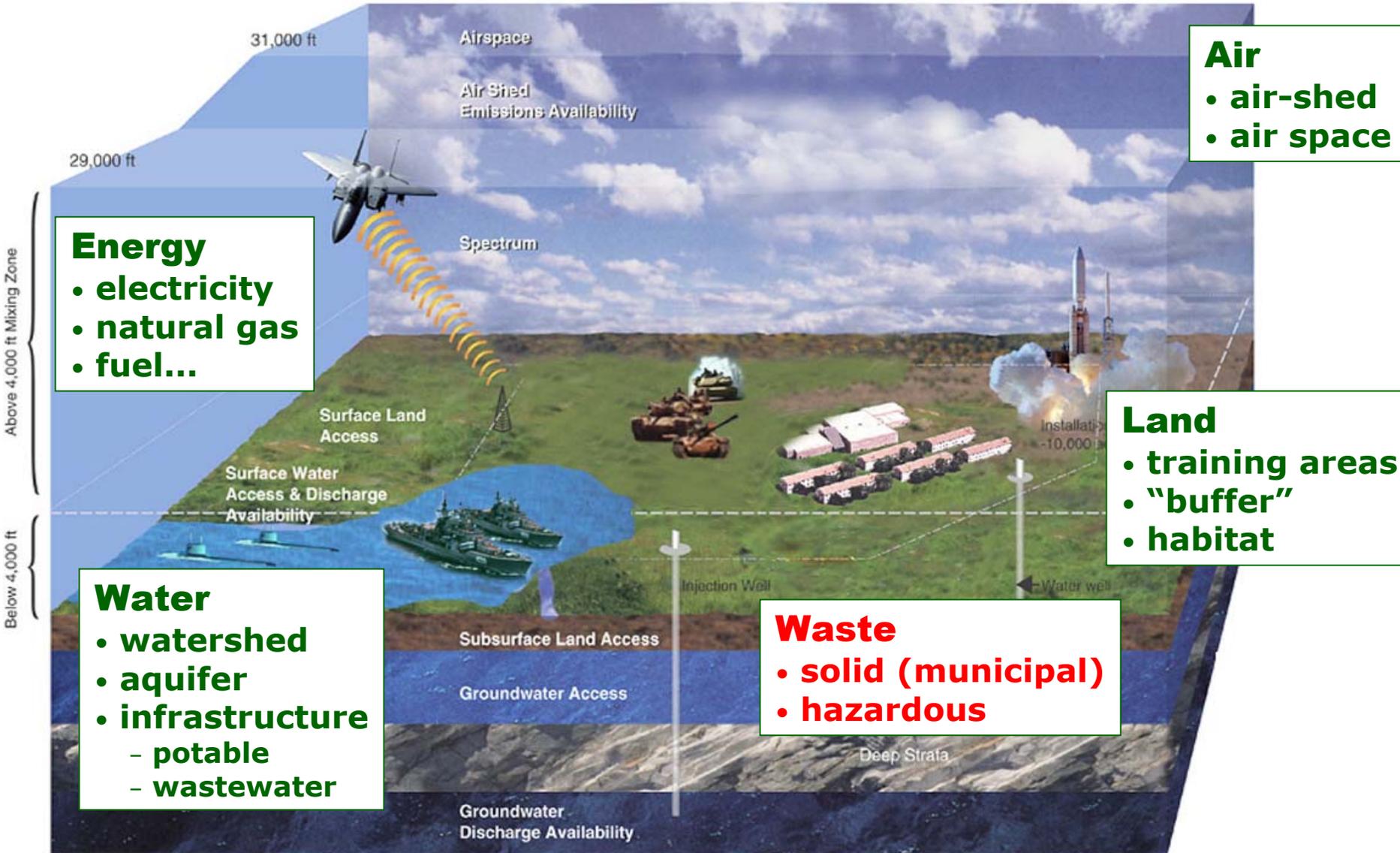


***“We’re at ‘zero balance’ on earths  
— we’ve only got one, no spares.”***

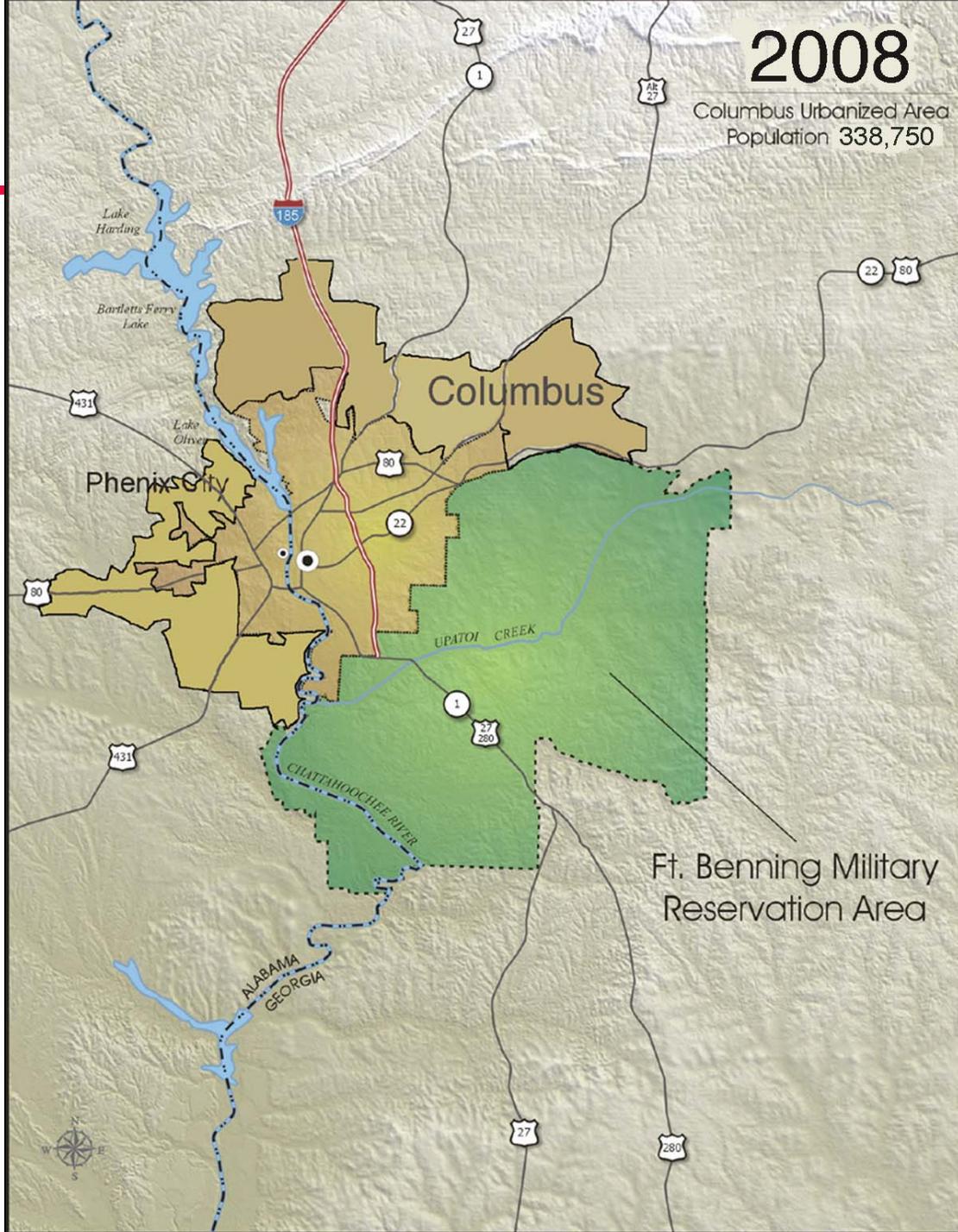
***MG Lust***

***U.S. Army, Assistant Chief of Staff for Installation Management***

# Resources We Need



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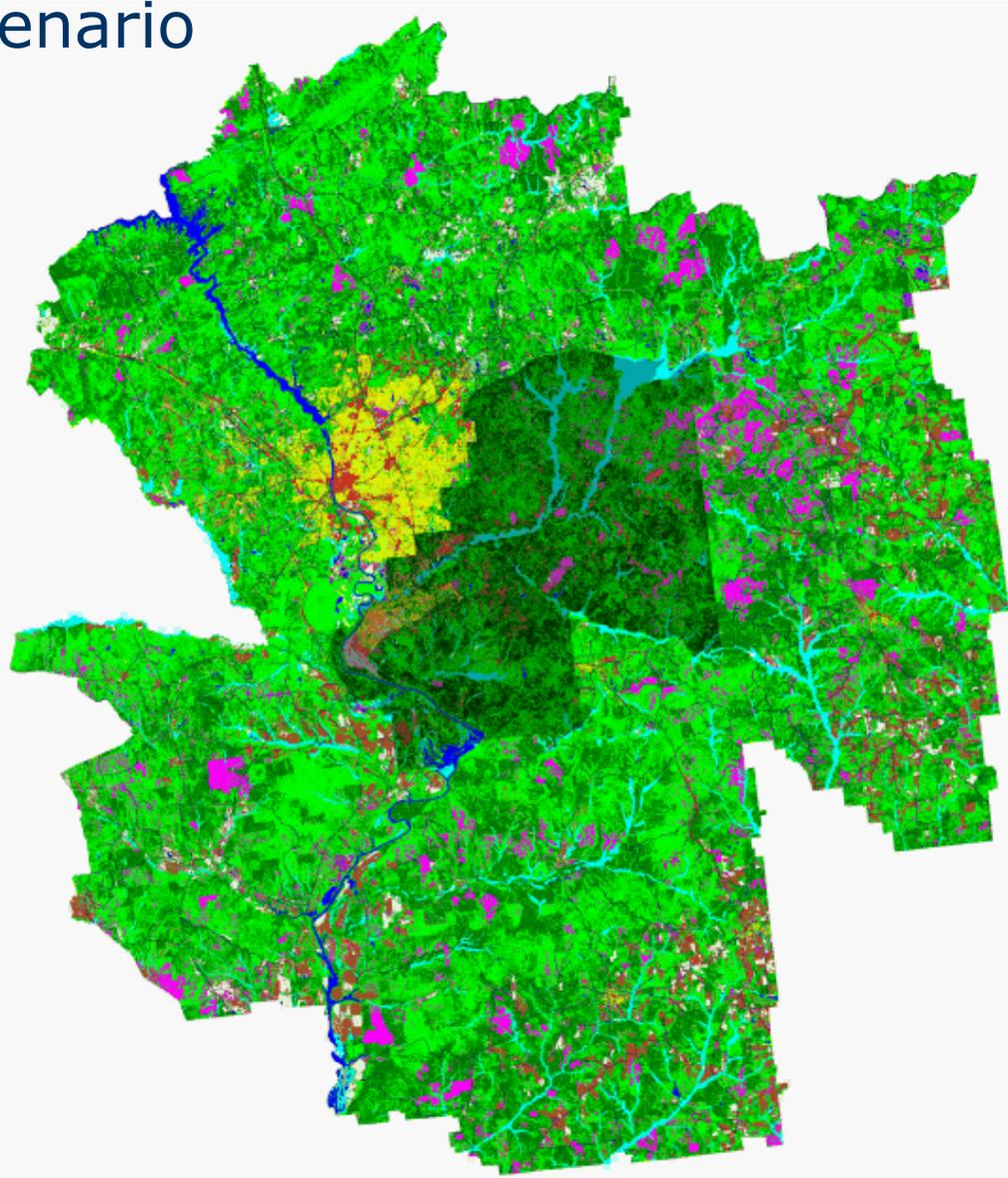




# Regional Urbanization



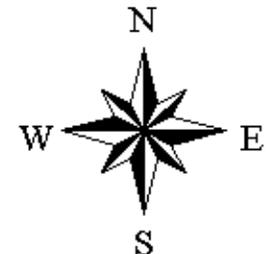
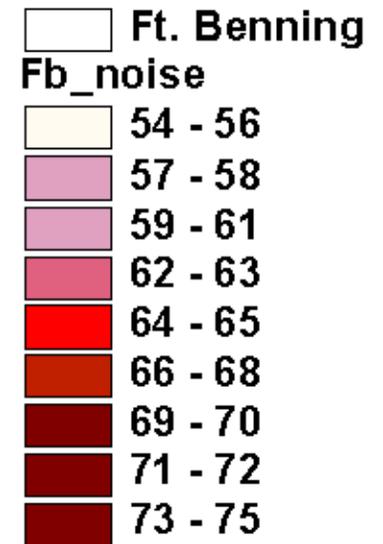
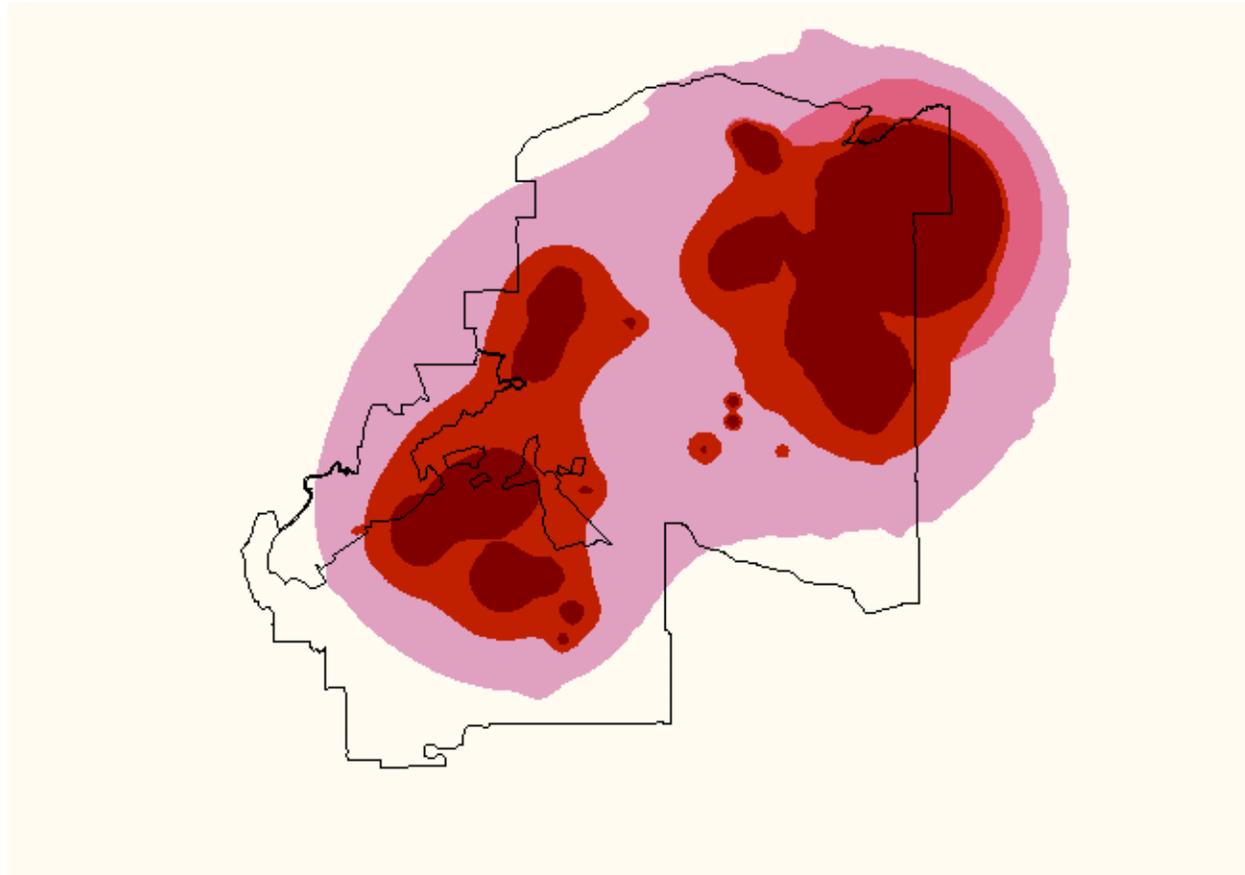
Land use change scenario  
Years 2000 - 2040



Fort Benning, GA

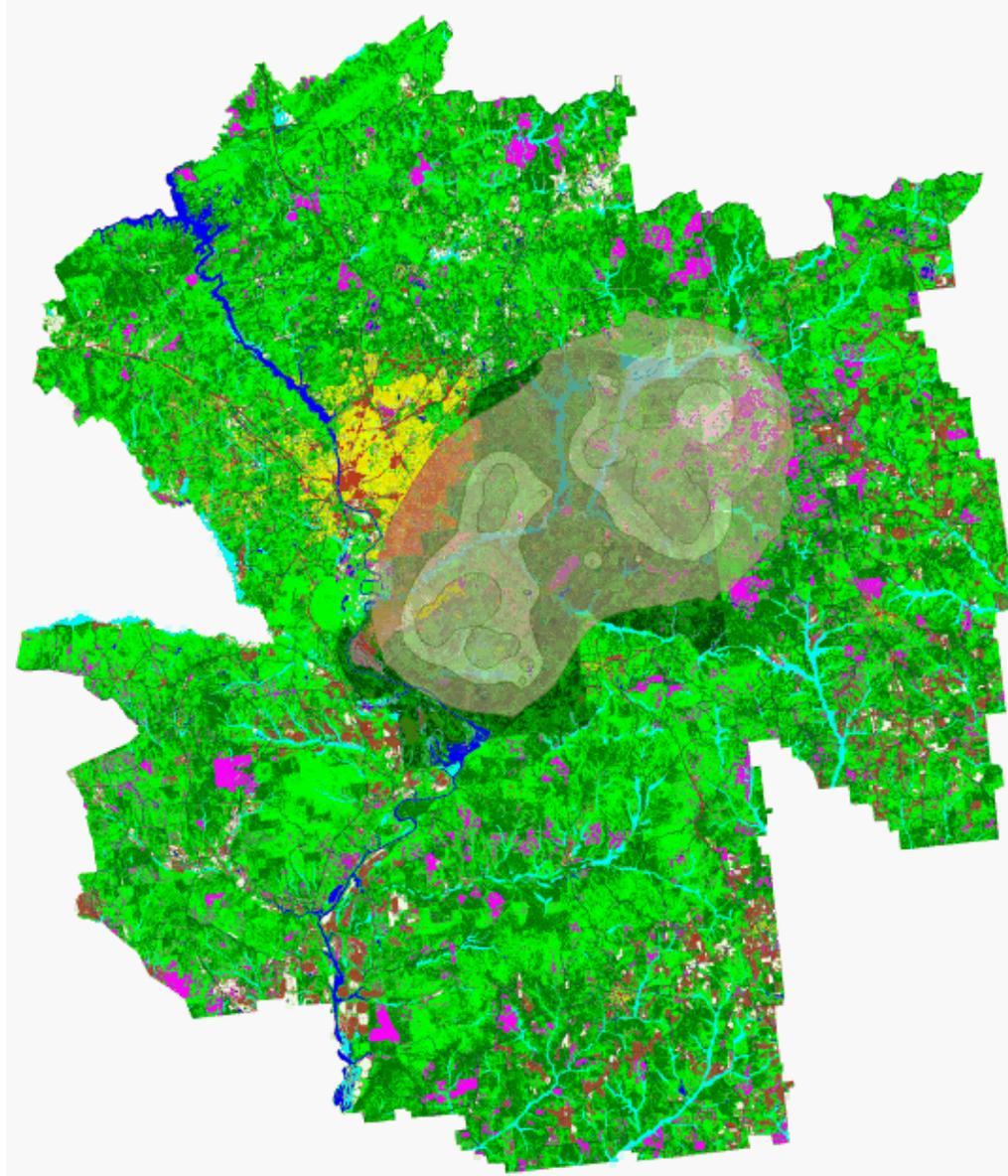


# Mission "Externalities" - Noise





# Noise + Urbanization = Conflict



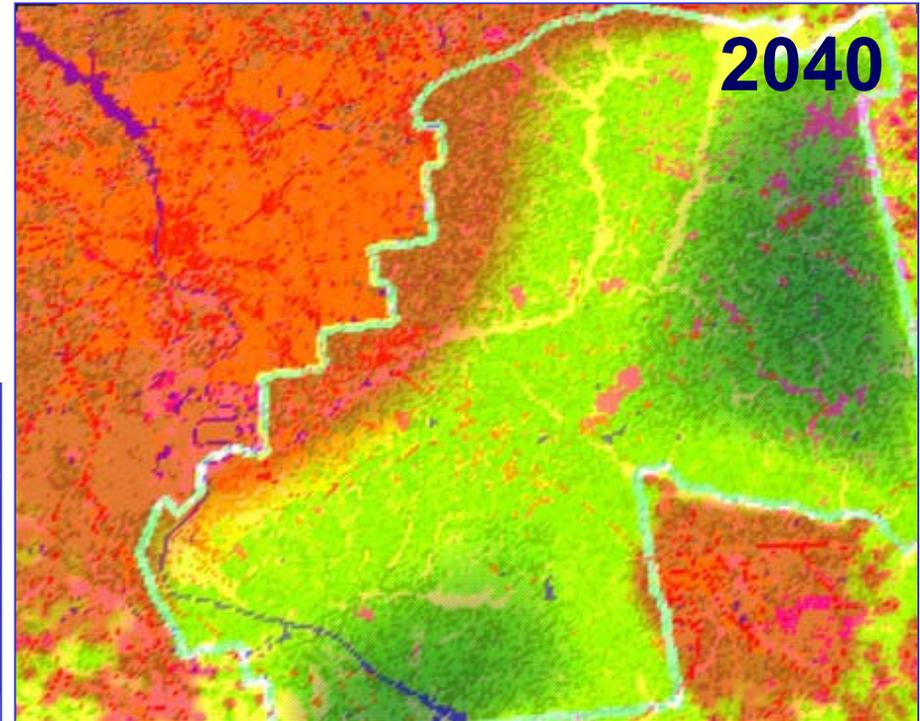
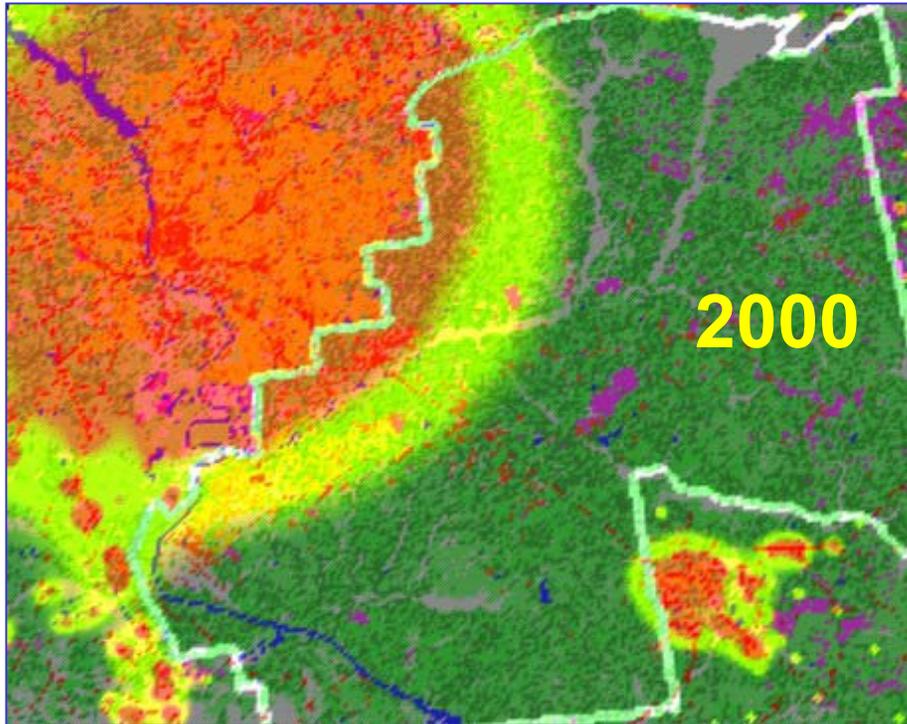


# Long-Term Mission Impacts



Ft Benning, GA

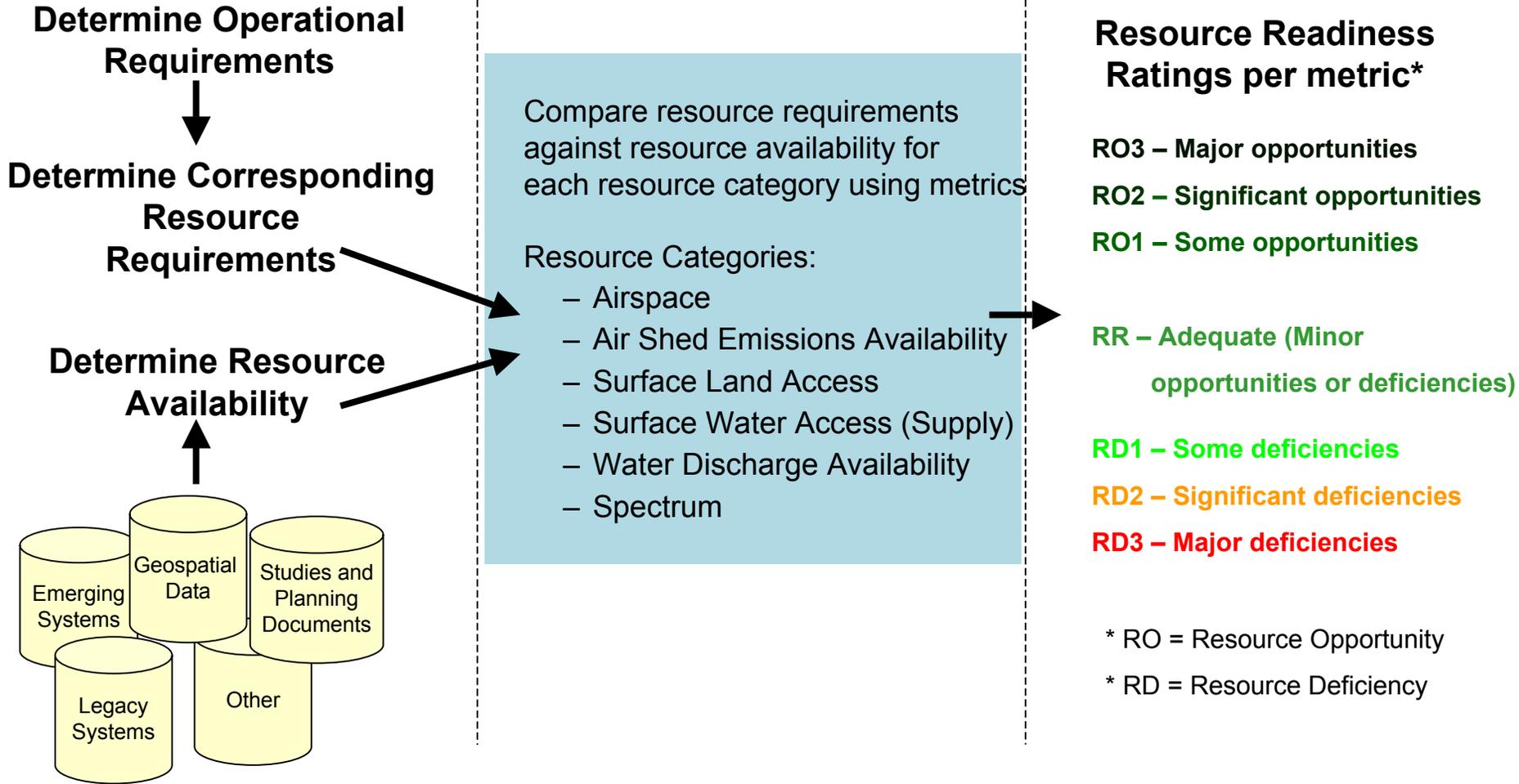
Population density scenario  
Years 2000 - 2040



Result = possible loss  
of future training  
opportunities due to  
noise related conflicts



# Resource Capability Model\*



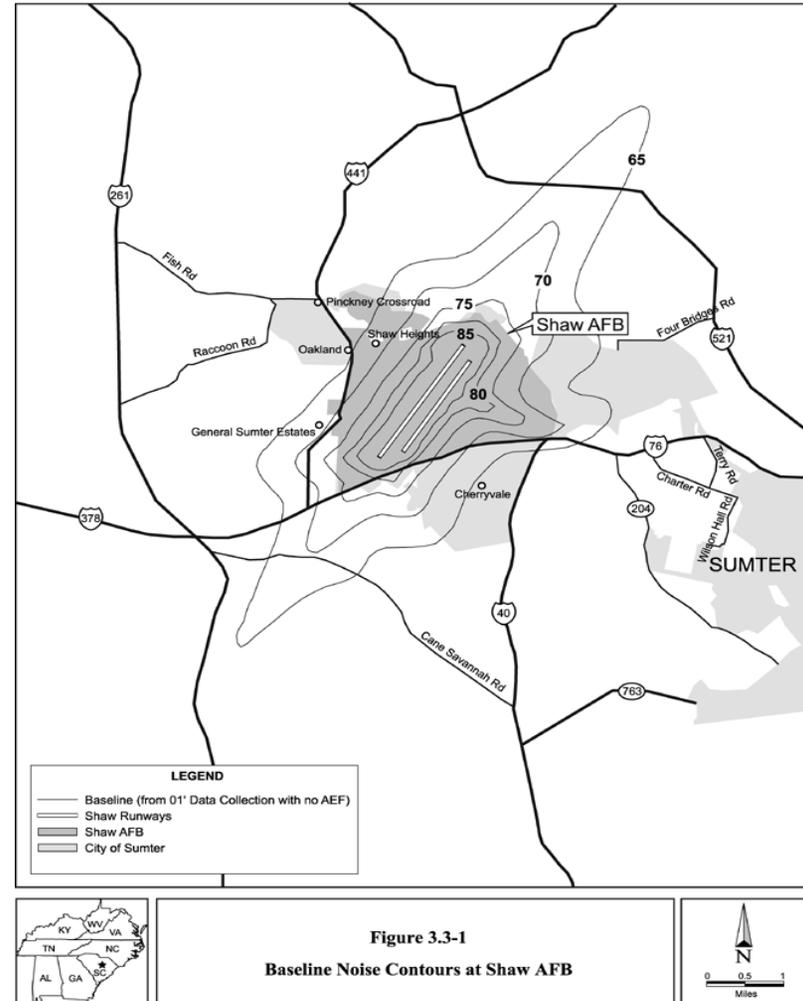
*\* Developed by Booz-Allen Hamilton*



# Ex: Surface Land Resource Adequacy for Off-Site *Compatible* Acres



- Resource *Requirements* defined by acres within 65+ dB contours
  - Total acres = 9,600
  - Off-base acres = 6,300
  - On-base acres = 3,300
- Resource *Availability* defined by “compatible acres”
  - 5,355 - 5,600 compatible acres
  - 700 - 945 incompatible acres using FAA guidelines (>65 dB DNL)
  - 85 - 89% compatible acres off-base
- Bottom line: Resource “demand” is greater than “supply”





# Sustainability Factors

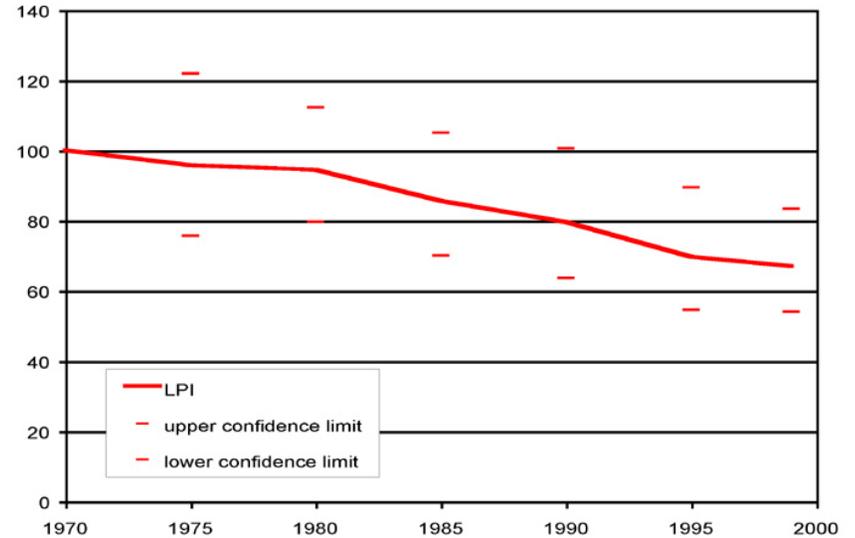


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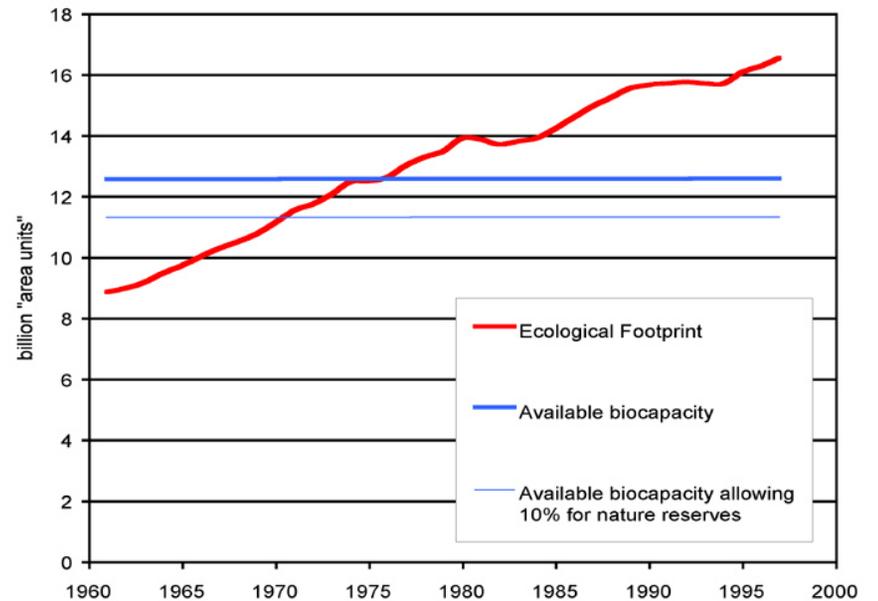


# Supply vs. Demand

Living Planet Index



Ecological Footprint

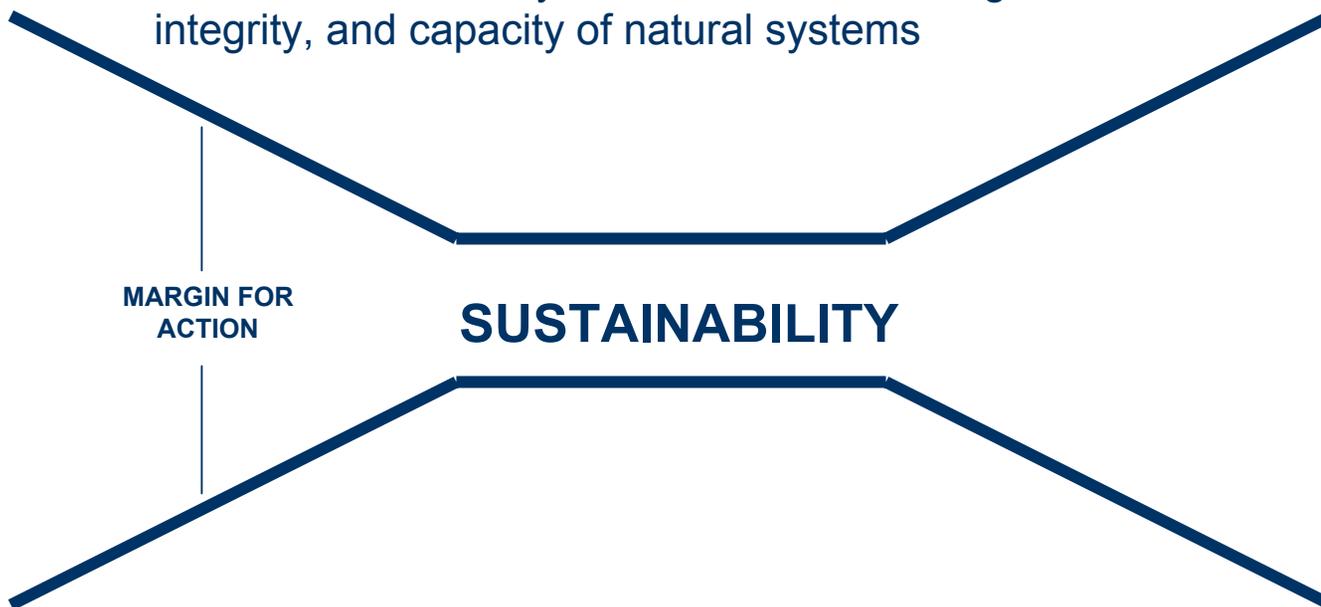




# Resource Funnel

## Resource Availability and Ecosystem Ability to Provide Vital Services

Raw materials, ecosystem services, declining integrity, and capacity of natural systems



## Societal Demand for Resources

Exponential growth in population, resource requirements as affluence increases, increased demands as technology spreads

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# "Back-casting" and Strategic Planning



## Resource Availability and Ecosystem Ability to Provide Vital Services

Raw materials, ecosystem services, declining integrity,  
and capacity of natural systems

An  
installation  
today

Unsustainable  
direction

Back-casting  
Steps to  
Sustainability

Proactive installation  
in a sustainable future

## SUSTAINABILITY

## Societal Demand for Resources

Exponential growth in population, resource requirements as affluence  
increases, increased demands as technology spreads

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# Sustainability Integration

## “Targets of Opportunity”

- Stationing

- Capacity Analysis
- Cost Analysis
- Impact Analysis

- Planning

- Strategic planning
- Regional planning
- Master planning

- Management

- ISO 14001 EMS
- ISO 14031 EPE
- Balanced Scorecard

- Costing

- Systems acquisition
- Stationing actions
- Facilities / infrastructure
- Base operations



# Sustainability Applications



- Installation Management / BASOPS
  - *viability* (long-term) of mission support capabilities
  - carrying *capacity*, encroachment and *elasticity*
  - *adaptability* in response to change
  - quality of life—community and individual *well-being*
- Weapon Systems and Military Operations
  - total ownership *costs*—“cradle-to-cradle”
  - lifecycle “environmental” (to include energy) *impacts*
  - logistical *footprint* and “tooth-to-tail” ratio
  - operational *signature* and *stealth*—enhanced capability

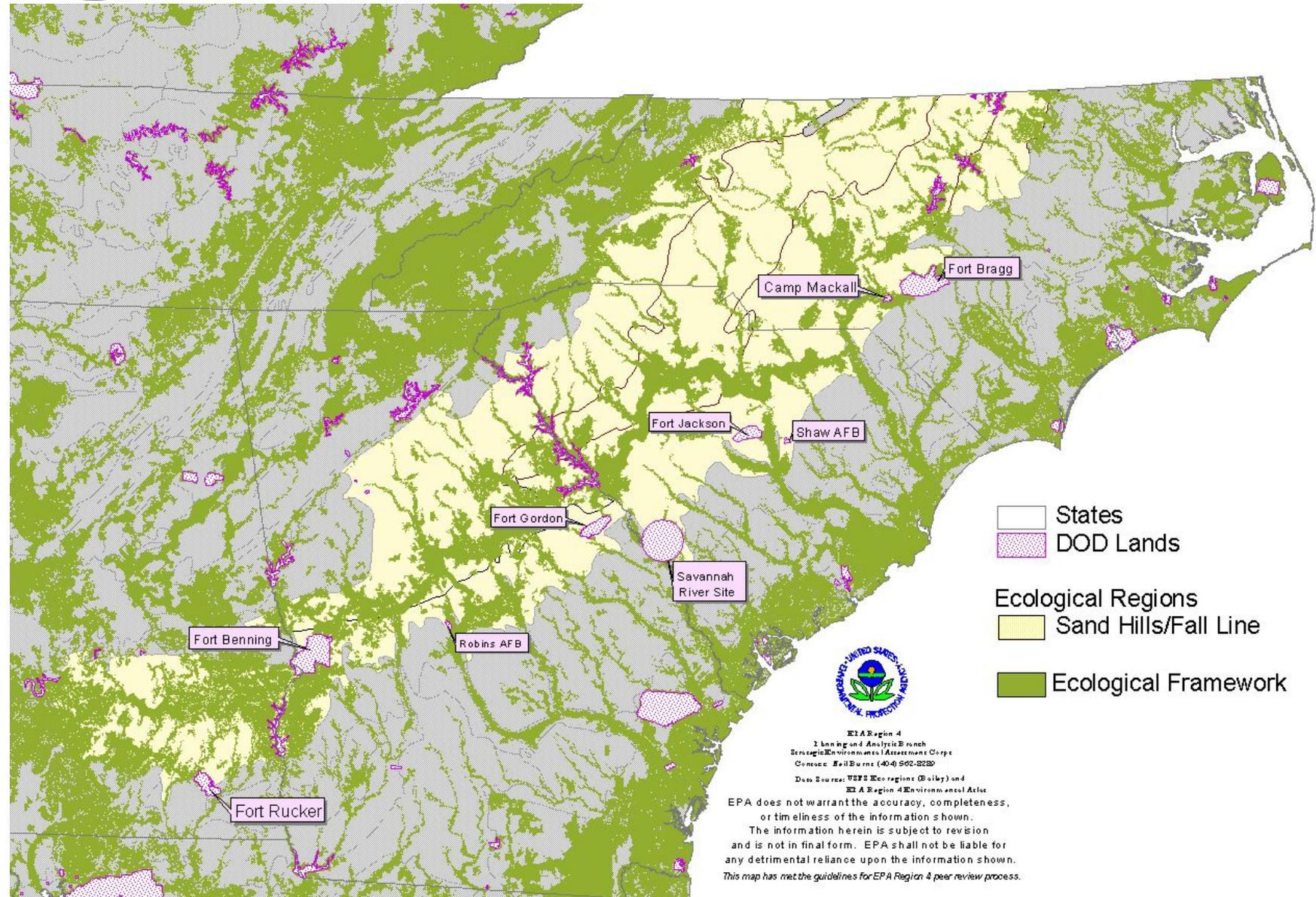


# “Business Case”

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- Increasing **cost** of doing “business”—  
i.e. executing the mission
  - Relationship between *supply* and *demand*
- Maintaining **capability** to meet current  
and future mission requirements
  - “Ready and relevant, today and tomorrow”

# Strategic Partnerships?



EPA Region 4  
 Planning and Analysis Branch  
 Strategic Environmental Assessment Corps  
 Contact: Neil Burns (404) 592-3230  
 Data Source: USFS Ecoregions (Boily) and  
 EPA Region 4 Environmental Atlas  
 EPA does not warrant the accuracy, completeness,  
 or timeliness of the information shown.  
 The information herein is subject to revision  
 and is not in final form. EPA shall not be liable for  
 any detrimental reliance upon the information shown.  
 This map has met the guidelines for EPA Region 4 peer review process.



# Closing Thought

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Sustainability is not a question of whether the earth can sustain itself—it can and will.

It is a question as to the extent to which the earth can sustain us—and for how long!



## Contact info:

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**david.s.eady@us.army.mil**

**de@marstel-day.com**



# Back Up Slides



# Closing Quote

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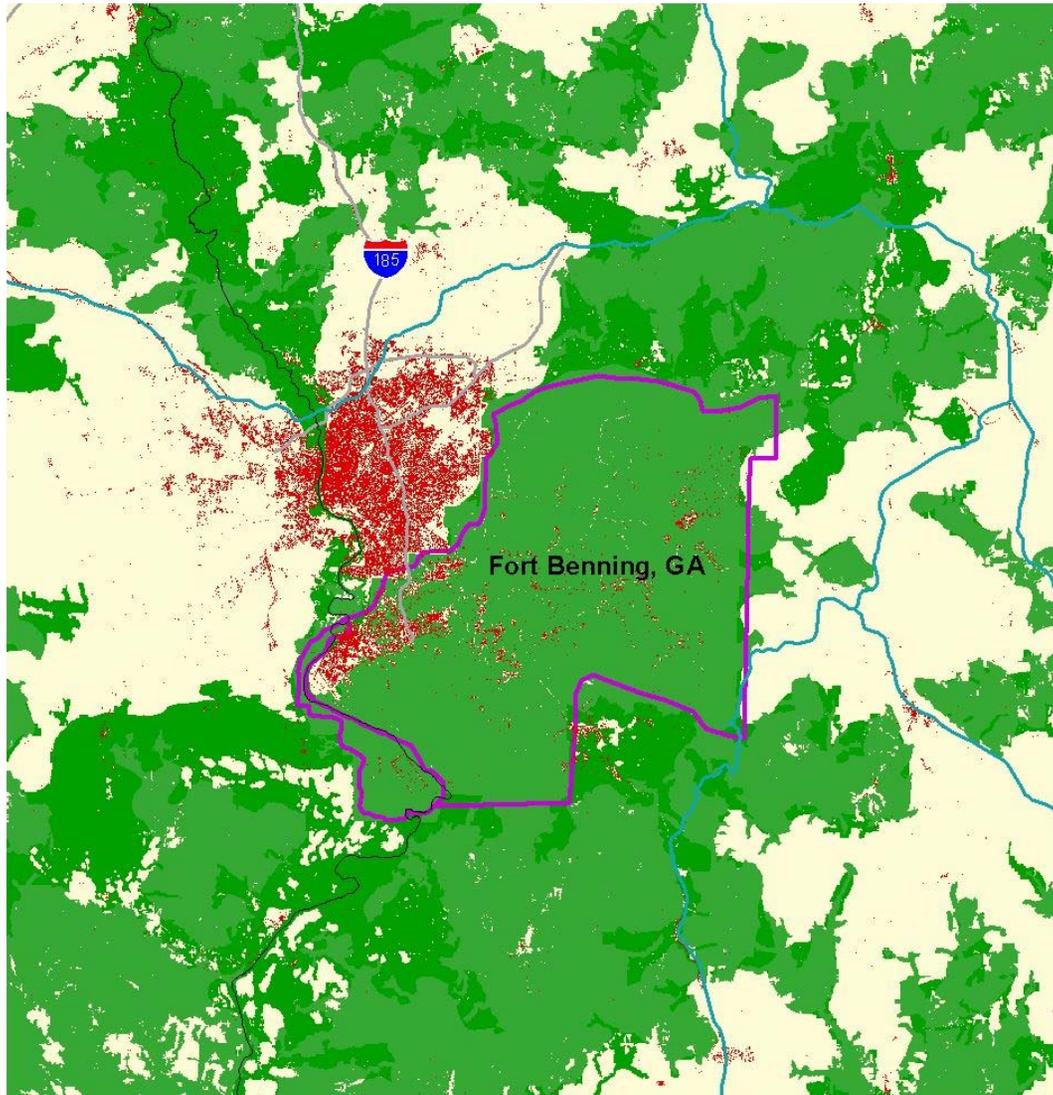


“...Sustainability moves us beyond simply solving today’s problems. A sustainable Army is one that wins today’s battles while laying the foundation for our future success. It connects today to tomorrow with sound business and environmental practices... Sustainability enables today’s Army to empower the Future Force.”

Assistant Secretary of the Army  
(Installations & Environment)  
September 2003



# Fort Benning and the Southeastern Ecological Framework



 8-digit HUCs (watersheds)

 Ft. Benning

 Ecological Framework

 Urbanized Land

1990





# Definitions

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## Sustain:

- To maintain; to keep alive; to support; to subsist; to nourish
- Lengthen or extend in duration or space
- Provide with nourishment
- Supply with necessities and support

## Ability:

- The quality of being able to perform; a quality that permits or facilitates achievement or accomplishment
- Possession of the qualities... required to do something or to get something done
- The quality or state of being able; power to perform, whether physical, moral, intellectual, conventional, or legal; capacity

## Capacity:

- Ability to perform or produce
- The amount that can be contained



# Definitions

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## Resilience:

- the amount of disturbance a system can absorb and still remain within the same state
- the ability of an ecosystem to undergo change while still maintaining its basic elements or relationships
- the power or ability to recover quickly—elasticity

## Elasticity:

- The condition or property of being elastic; flexibility
- The inherent property in bodies by which they recover... after the removal of external pressure or altering force
- springiness; resilience; tendency to rebound
- A measure of responsiveness

## Adaptive:

- Suited, given, or tending, to adaptation; characterized by adaptation; capable of adapting
- Having a capacity for adaptation



# Sustainability Strategies



- Dematerialization
  - Use less (reduce consumption)
  - Waste less (be more efficient)
- Substitution (Trans-materialization)
  - Replace “bad” with “good”
  - Eliminate the need for the “bad”



# Sustainability Aspects

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## From a *Military* Perspective

- Mission
- Community / Society
- Cost / Economics
- Environment



# “Significance”

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- Operationally
- Socially / Politically
- Financially / Economically
- Environmentally



# US Army Strategy for the Environment



- Sustain resources to support training, testing and other mission requirements
- Reduce lifecycle environmental impacts and total ownership costs of systems, materiel, facilities and operations
- Enhance operational capability and reduce environmental (and logistical) footprints
- Promote well-being and quality of life for soldiers, civilians, dependents and neighbors

More than 13 million children  
in America are  
struggling to survive.

# Won't You Help Feed Them?

By David Oliver Relin



*It's a quiet catastrophe that's rarely reported, yet child hunger is a problem we can solve together. PARADE Contributing Editor David Oliver Relin spent months traveling across the country, visiting families in the neediest communities. Here's what he saw.*

**I**N THE RIO GRANDE VALLEY, ONLY a few miles from the border, a woman has to use half of her last loaf of white bread. The

Compean neighborhood, but like millions of families term for those who must survive on a diet not nutritious enough to keep a child healthy. More than 13 million of those

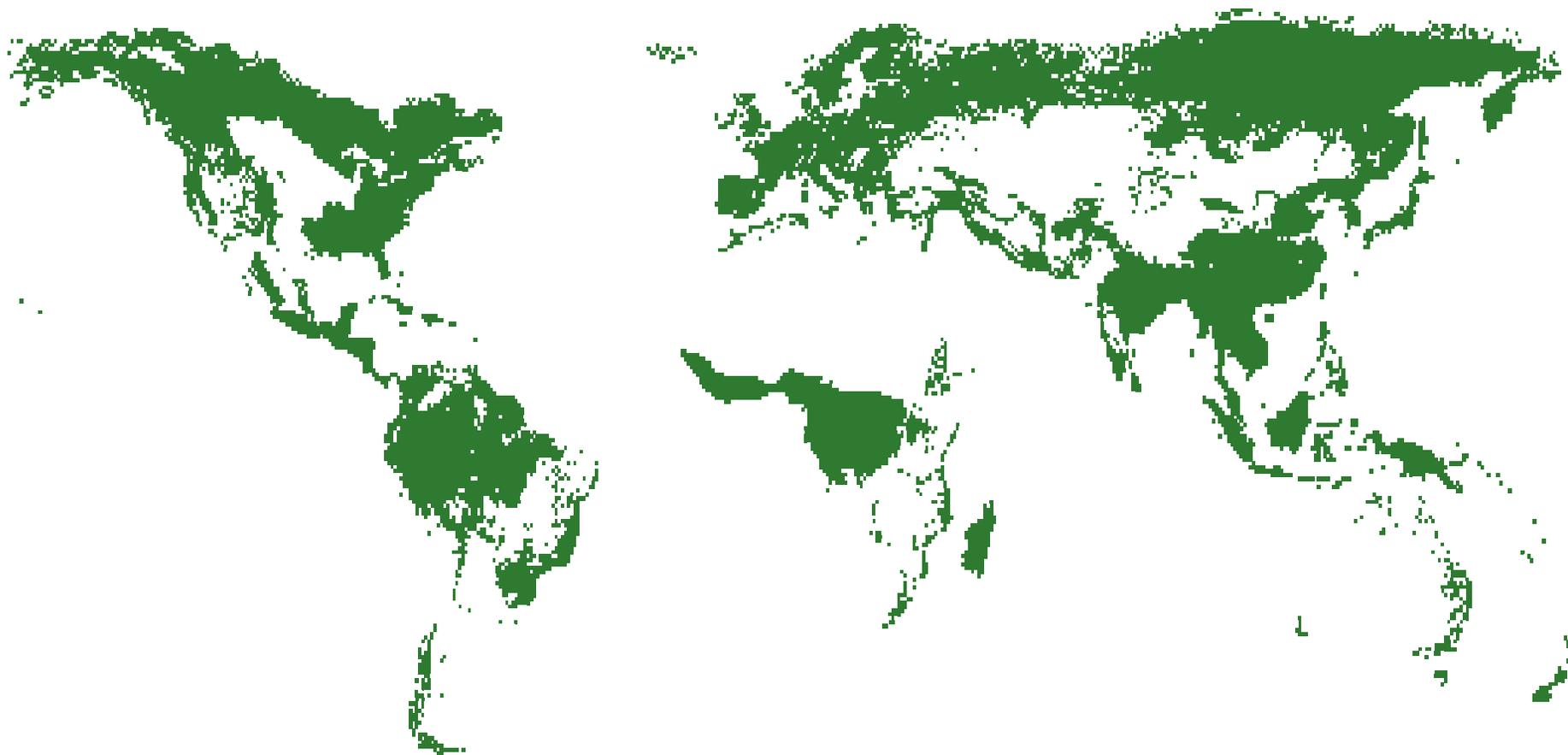
people were children. The U.S. Conference of Mayors expects that requests for emergency

Dulce Compean, 23, and her sons—Ibrayn, 2, Edgar, 6, Ismael Jr., 4, and Eduardo, 7—are among thousands struggling to survive in the Rio Grande Valley.



# Frontier Forests

8,000 Years Ago



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# Frontier Forests

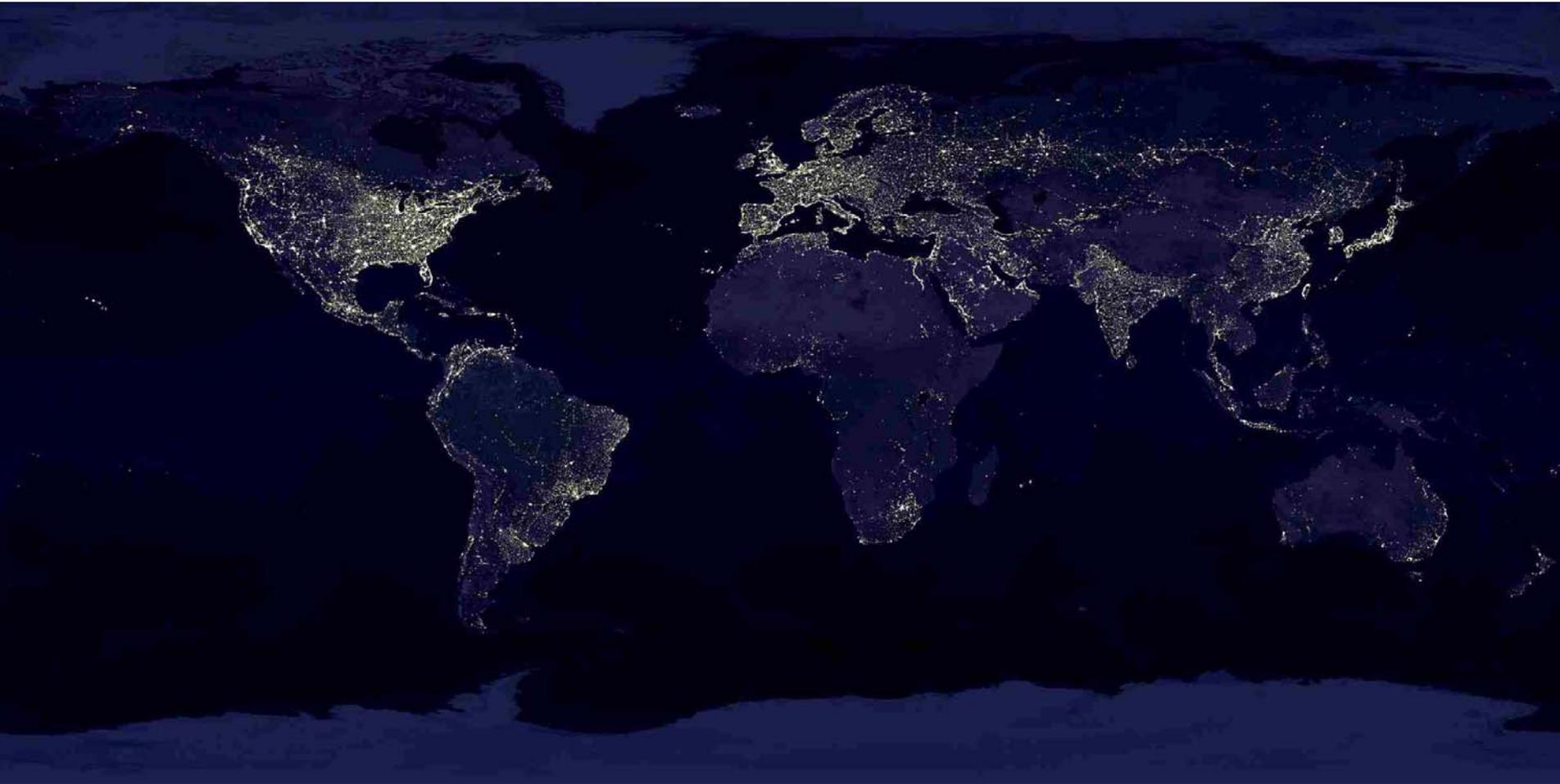
## Today



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# Earth Lights



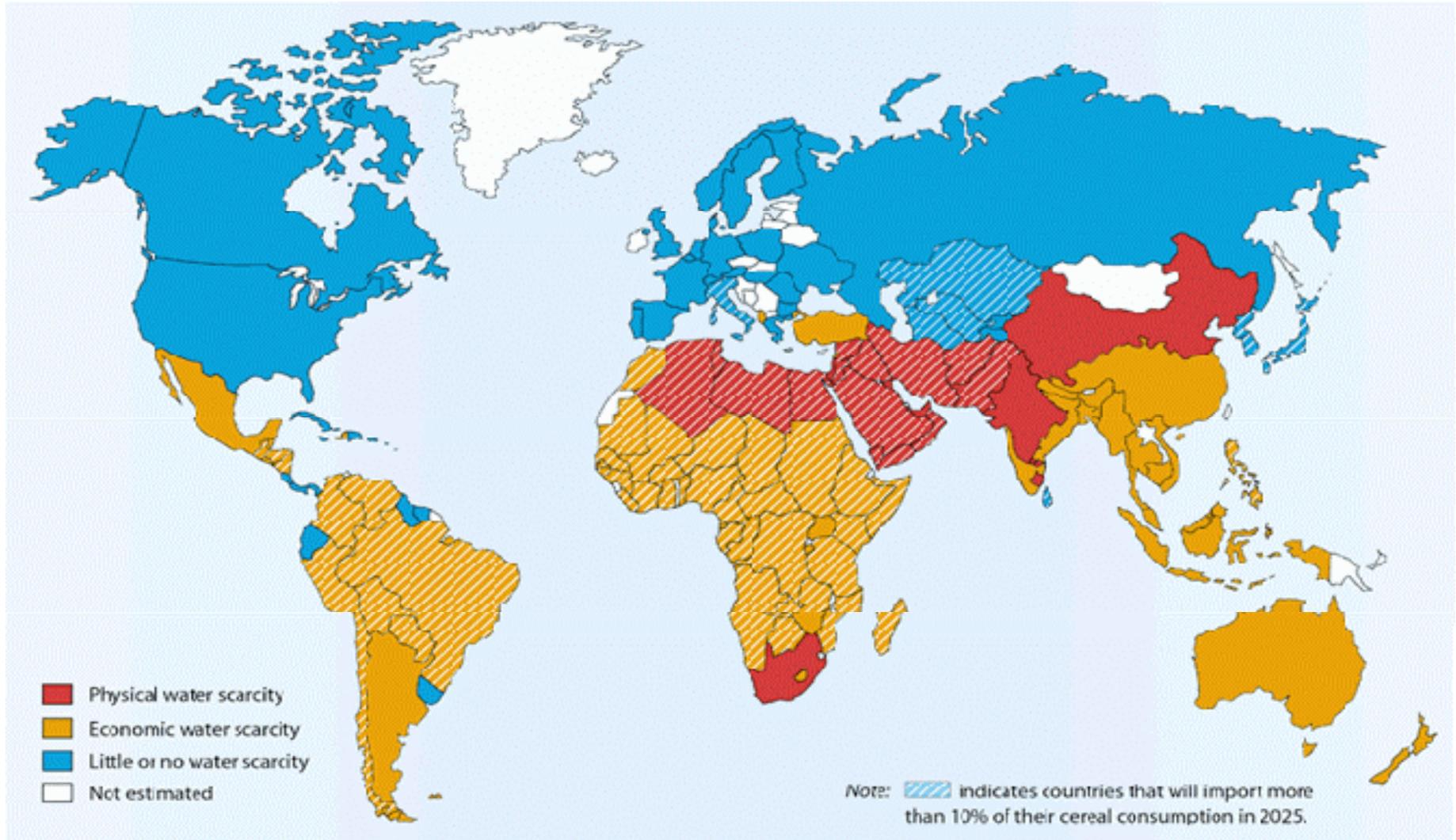


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# Water Scarcity

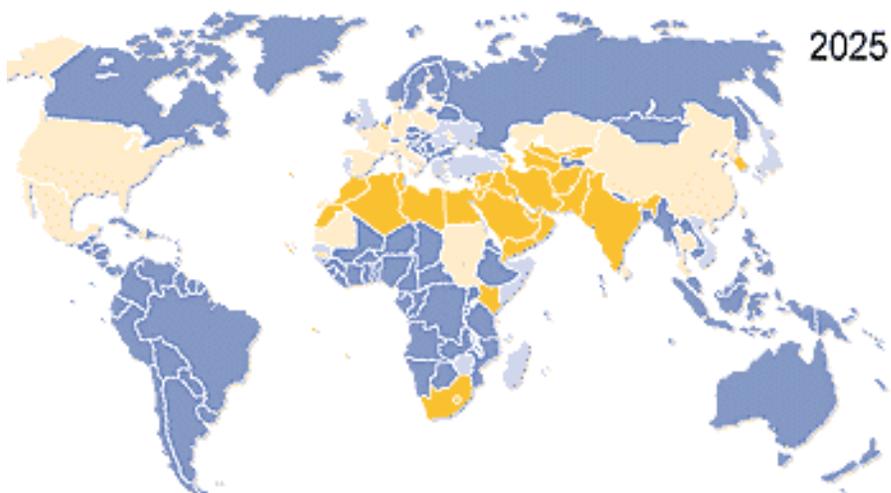
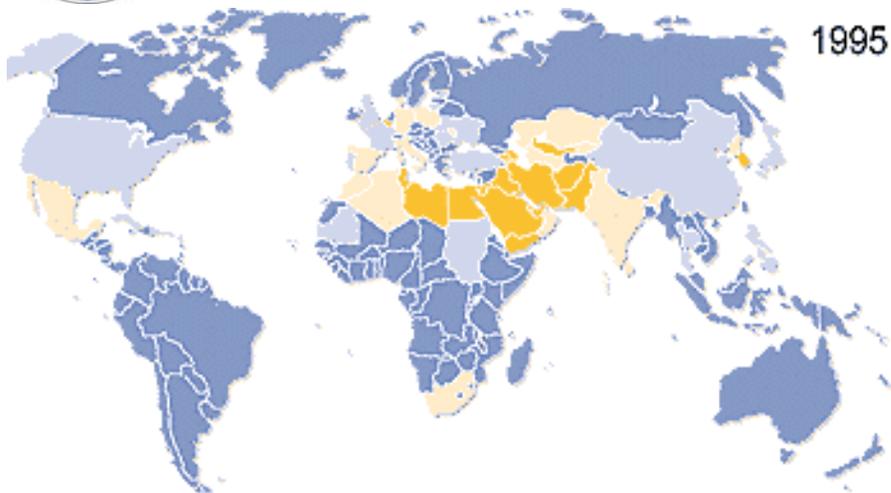


Source: International Water Management Institute 2002

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# Water Scarcity



water withdrawal as percentage of total available

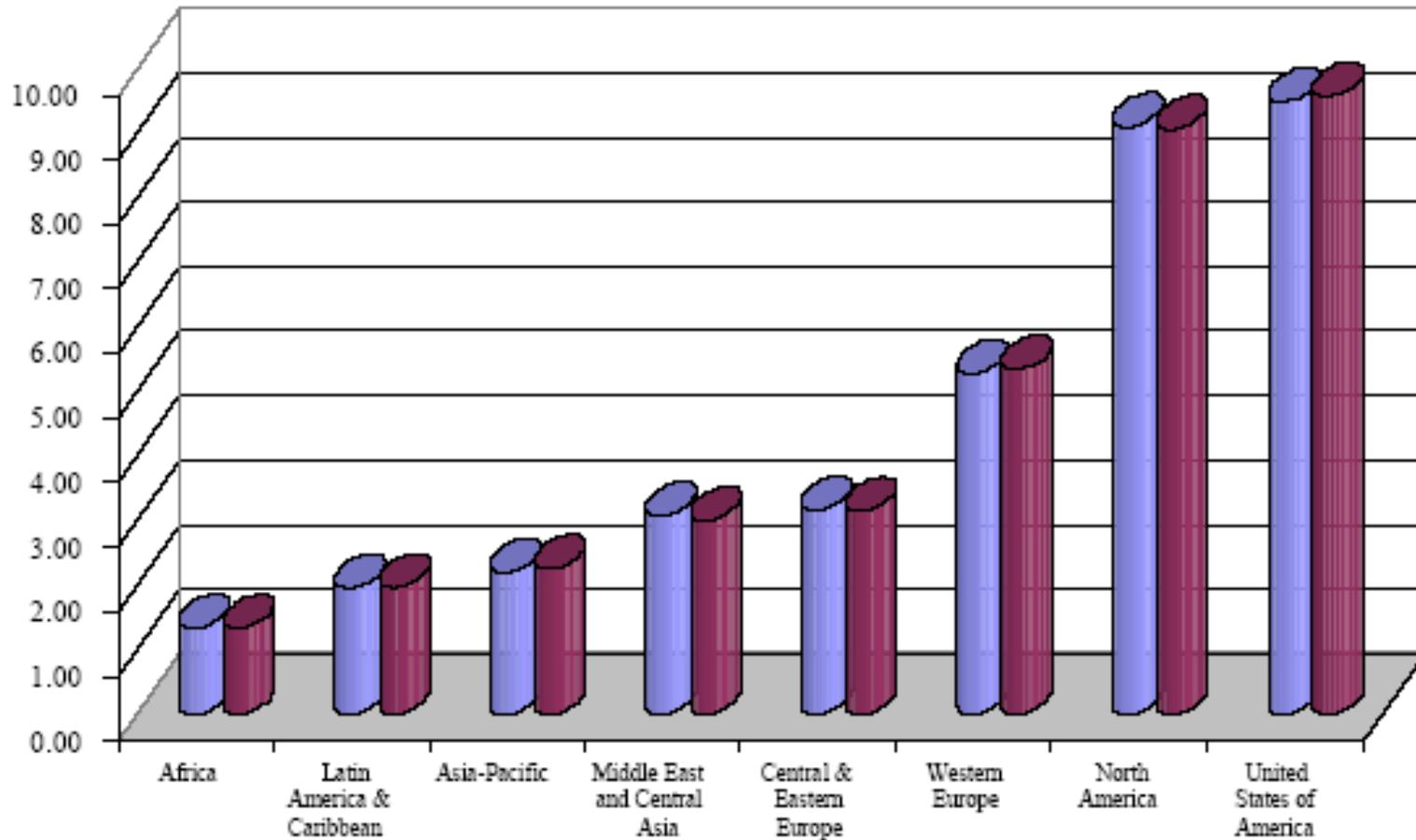
more than 40%	20% to 10%
40% to 20%	less than 10%

The US intelligence community predicts that changes in population and the spread of information and disease will increasingly threaten US national security.

Water scarcity is expected to be a significant contributor to instability around the world.



## PER CAPITA FOOTPRINTS BY REGION 1999-2000



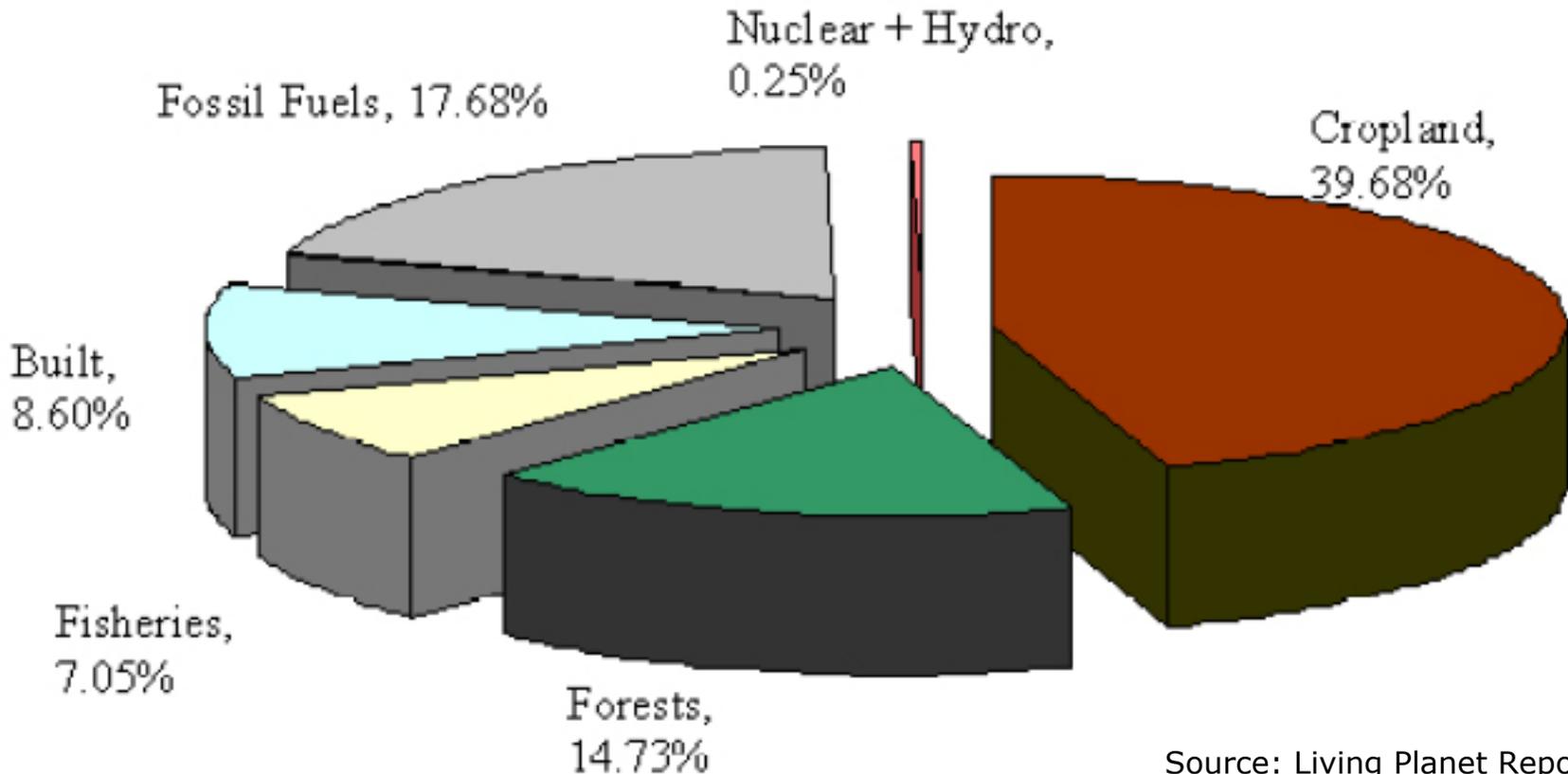
Source: Living Planet Report (2000)

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# Sources of Footprints

## Lower Income Countries

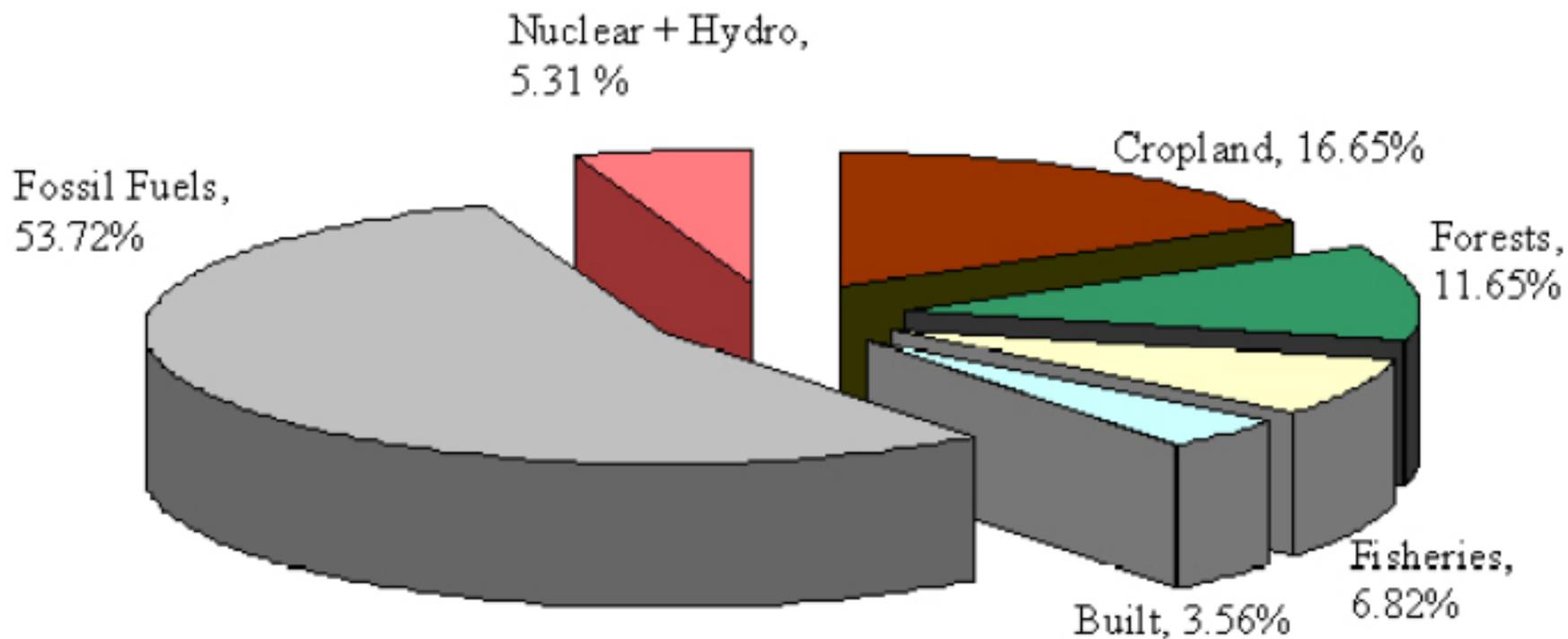


Source: Living Planet Report (2000)



# Sources of Footprints

## Higher Income Countries



Source: Living Planet Report (2000)